

Serial No. 09/253,245 Filed 02/19/1999

5

REMARKS

1. With respect, it is believed that Examiner has inadvertently omitted claim 22 from the list of claims still under consideration. Claim 22 was present in the Amendment mailed May 9, 2003. The following remarks assume that claim 22 is present and has been rejected.
2. Independent claims 1 and 27, and claims 2-17, 19-20, 22-23, and 28 dependent thereon stand rejected under 35 USC§112 as being indefinite.

Claim 1 has been amended to include an "SEAT" standard for ballistic effectiveness. Support for the amendment is found in the specification in Examples 12 (p.35, line 28, and Table 4 on p.37) and 13 (Table 5 on p.39).

Claim 27 has been amended to include a "V50" standard for ballistic effectiveness, as well as the subject matter of claim 28. Claim 28 has been cancelled. Support for this amendment is found in examples set forth in the specification (see Tables 4 and 5 on, respectively, pp. 37 and 39).

Since no new matter has been added by these amendments, it is respectfully submitted that they should be entered.

3. The meaning of "SEAT" is evident from its units – energy (Joules) per unit areal density (Kg/m^2) of the composite. The man of ordinary skill in the art would be familiar with this measurement (see below) or would quickly discern its meaning from the values of ADT and V50 presented in Tables 4 and 5.

The term "SEAT" has been employed in a number of patents to describe ballistic effectiveness. The meaning and measurement of "SEAT" was defined as the specific energy absorption based on the total areal density of the composite in a number of United States Patents. For example:

- 4,820,568, Col.11, lines 37-40;
- 5,185,195, Col. 19, note 6 of Table 2;
- 5,254,383, Col.1, lines 49-52;
- 5,376,426, Col.2, lines 3-7;
- 5,545,455, Col.1, lines 61-63; and
- 5,591,933, Col.1, lines 62-64.

Serial No. 09/253,245 Filed 02/19/1999

6

SEAT values appear, without apparent need for further explanation, in United States Patents 5,175, 040, Table 3, and 5,198,280, Table 3.

It is submitted that inclusion of the "SEAT" value in amended claim 1 provides a clear and definite standard of ballistic effectiveness whose meaning is well known to the man of ordinary skill in the art.

Similarly, the term "V50" appearing in claim 27 has been defined and employed in many patents as an index of ballistic effectiveness and appears in the claims of United States Patents 5,749,140, 6,087,013, and 6,610,617 B2. It is submitted that the term "V50" is a clear and recognized standard of ballistic effectiveness whose meaning is well known to the man of ordinary skill in the art.

4. Claims 1-17, 19-20, 22-23 and 27-28 stand rejected under 35 USC §103(a) as being unpatentable over Schirtzinger, USP 3,686,048 (the '048 patent), in view of WO 91/08895 to Li et al (the '895 patent).

Applicants respectfully request the withdrawal of these rejections for the reasons that independent claims 1 and 27, as amended, include the following limitations that have no counterpart in either the '048 patent or the '895 patent or their combination.

a) Ballistic effectiveness and flexibility

In contrast to the present invention, neither the '048 patent nor the '895 patent describes or suggests a ballistically effective and flexible composite. The objective of the '048 patent is a structural material, i.e., a rigid material (Col. 1-2), not a ballistically effective material. The objective of the '895 patent is a rigid ballistic composite (page 3, lines 5 and 23).

b) Size of the matrix islands

In contrast to the present invention, the '048 patent provides no definite limitation on the size of the matrix islands. "Minute bridges" are mentioned at Col. 3, line 36, but no guidance is provided as to the meaning of this term. In view of the different objectives of the present invention (ballistic effectiveness) and the '048 patent (a structural material), it is respectfully submitted that the skilled man seeking a ballistically effective, flexible material would not seek direction from the '048 patent. It is also highly unlikely that routine experimentation for the purpose of providing a structural material would yield the same result for the size of the matrix islands as described in the present invention.

In contrast to the requirements of the present invention, the '895 patent teaches substantially coating the individual filaments (page 4, lines 18-19) and filling the volume not occupied by fibers with the matrix material (page 22, lines 24-28).

c) Final volume ratio of the matrix

In contrast to the present invention, the '048 patent provides for a "pre-ply" that becomes filled with matrix material in its final state (Col 2, lines 49-54). The '895 patent has a similar teaching (see above).

Serial No. 09/253,245 Filed 02/19/1999

7

Examiner suggests that in view of Schirtzinger, it would be obvious to select the proportions of resin through a process of routine experimentation suitable for the final use of the composite material. Applicants' respectfully submit that a person seeking "high-impact resistant" (P.1, line 9) ballistically effective articles would take Schirtzinger as a point of departure only with hindsight and with knowledge of the present invention. Schirtzinger teaches (col. 4, lines 45-47) a composite wherein the matrix is ". . . allowed to flow through the interfilamentary spaces to completely wet all of the fibers in the assembly." It is true that there is an intermediate stage in Schirtzinger where the fibers are connected by "minute bridges." However, it is submitted that the idea that a similar structure, within a specific range of matrix composition, could be the basis of a ballistically effective composite would require a flash of genius, not the knowledge of the man of ordinary skill in the art. Hence, it would be decidedly nonobvious to reach the present invention by selecting Schirtzinger as a point of departure for routine experimentation.

It is submitted that the situation with respect to the references cited against claims 1 and 27 is as summarized in the following table.

Serial No. 09/253,245 Filed 02/19/1999

8

Limitation	Schirtzinger '048	Li et al. '895	Claim 1 or Claim 27
Ballistic Effectiveness	No	Yes	Yes
Size of Matrix Islands	No	No	Yes
Matrix Fills the Void Volume	No*	Yes	No

*Matrix fills the void volume in the final state

It is seen that the '048 patent and the '895 patent cannot be combined to teach all of the claimed limitations of the present invention. Applicants respectfully submit, therefore, that a *prima facie* case of obviousness has not been established for amended claims 1 and 27, and claims 2-17, 19-20, and 22-23 that depend directly or indirectly therefrom.

5. In light of the foregoing amendments and remarks, it is submitted that the claims now of record, i.e., claims 1-17, 19-20, and 22-23 are allowable and should be passed to issue. Applicants respectfully request the same. The Examiner is invited to call the undersigned attorney if there are any unresolved issues to discuss same.

Respectfully submitted,
GARY A. HARPELL ET AL.

By Virginia Szigeti
Virginia Szigeti (Andrews)
Applicants' Attorney
Reg. No. 29,039

Honeywell International Inc.
15801 Woods Edge Road
Colonial Heights, VA 23834
(804) 520-3651

I hereby certify that this correspondence is being deposited with the United States Patent & Trademark Office via facsimile to Examiner Elizabeth Cole, Group Art Unit 1771, at 703-872-9310 on June 1, 2004.

Virginia Szigeti
Virginia Szigeti